

CLAIMS

What is claimed is:

1. A method for manufacturing thin film transistor panel, at least, comprises following step:

5 provide a silicon substrate;

form a of transparent insulator on the front surface of said silicon substrate;

form a plurality of thin film transistor structures and a plurality of corresponding transparent electrodes on said transparent insulator;

bond a transparent substrate onto the front surface of said silicon substrate;

10 remove said silicon substrate; and

etch said transparent insulator to expose said transparent electrode.

2. A method for manufacturing thin film transistor panel of claim 1, wherein said transparent insulator is SiO_x .

3. A method for manufacturing thin film transistor panel of claim 1, wherein said
15 transparent insulator is SiN_x .

4. A method for manufacturing thin film transistor panel of claim 1, wherein the thickness of said transparent insulator is below one micrometer.

5. A method for manufacturing thin film transistor panel of claim 1, wherein the material of said transparent electrode is indium tin oxide.

20 6. A method for manufacturing thin film transistor panel of claim 1, wherein said

transparent substrate is glass substrate.

7. A method for manufacturing thin film transistor panel of claim 1, wherein said transparent substrate is polymer substrate.

8. A method for manufacturing thin film transistor panel of claim 1, wherein the method
5 for removing said silicon substrate includes chemical mechanical polishing.

9. A method for manufacturing thin film transistor panel of claim 1, wherein said the method for removing said silicon substrate includes etching process.

10. A method for manufacturing thin film transistor panel of claim 1, further comprises a step for forming alignment mark on said transparent insulator.

10 11. A method for manufacturing thin film transistor panel of claim 1, further comprises a step for forming a back matrix on said thin film transistor structure before bonding said transparent substrate onto the front surface of said silicon substrate.

12. A method for manufacturing thin film transistor panel of claim 1, wherein the step for forming said thin film transistor structure and said transparent electrode comprises:

15 form a transistor thin film and a transparent electrode on said transparent insulator;

form a gate insulator covering said transistor thin film and said transparent electrode;

form a gate electrode on said gate insulator corresponding to the position of said transistor thin film;

form an interlayer on said gate electrode and said gate insulator;

20 form a metal contact layer on said gate insulator; and

form a passivation layer on said metal contact layer.

13. A method for manufacturing thin film transistor panel of claim 12, wherein the material of said transistor thin film can be anyone of the group of polycrystal silicon (p-Si) 、 polycrystal germanium (p-Ge) 、 polycrystal silicon germanium (p-SiGe) 、 crystal silicon (c-Si) 、 crystal germanium (c-Ge) 、 crystal silicon germanium (c-SiGe) .

5 14. A method for manufacturing thin film transistor panel of claim 12, further comprises a step of forming a color filter on said passivation layer.

15. A method for manufacturing thin film transistor panel, at lease, comprise following steps:

provide a silicon substrate;

10 form a transparent insulator on the front surface of said silicon substrate;

form a plurality of thin film transistor structures on said the transparent insulator;

bond a transparent substrate onto the front surface of said silicon substrate;

remove said silicon substrate; and

15 form a plurality of transparent electrodes corresponding to said thin film transistor structure on the bottom surface of said transparent insulator.

16. A method for manufacturing thin film transistor panel of claim 15, wherein said transparent insulator is SiO_x .

17. A method for manufacturing thin film transistor panel of claim 15, wherein said transparent insulator is SiN_x .

20 18. A method for manufacturing thin film transistor panel of claim 15, wherein the thickness of said transparent insulator is below one micrometer.

19. A method for manufacturing thin film transistor panel of claim 15, wherein the material of said transparent electrode is indium tin oxide.

20. A method for manufacturing thin film transistor panel of claim 15, wherein said transparent substrate is glass substrate.

5 21. A method for manufacturing thin film transistor panel of claim 15, wherein said transparent substrate is polymer substrate.

22. A method for manufacturing thin film transistor panel of claim 15, wherein the method for removing said silicon substrate includes chemical mechanical polishing.

10 23. A method for manufacturing thin film transistor panel of claim 15, wherein said the method for removing said silicon substrate includes etching process.

24. A method for manufacturing thin film transistor panel of claim 15, further comprises process for forming alignment mark on said transparent insulator.

15 25. A method for manufacturing thin film transistor panel of claim 15, further comprises process for forming a back matrix on said thin film transistor structure before bonding said transparent substrate onto the front surface of said silicon substrate.

26. A method for manufacturing thin film transistor panel of claim 15, wherein the steps for forming said thin film transistor comprises:

form a transistor thin film on said front surface of said transparent insulator;

form a gate insulator covering said transistor thin film and said transparent electrode;

20 form a gate electrode on said gate insulator corresponding to the position of said transistor thin film;

form an interlayer on said gate electrode and said gate insulator;

form a metal contact layer on said gate insulator; and

form a passivation layer on said metal contact layer.

27. A method for manufacturing thin film transistor panel of claim 26, wherein the
5 material of said transistor thin film can be anyone from the group of polycrystal silicon (p-Si)、polycrystal germanium (p-Ge)、polycrystal silicon germanium (p-SiGe)、crystal
silicon (c-Si)、crystal germanium (c-Ge)、crystal silicon germanium (c-SiGe) .

28. A method for manufacturing thin film transistor panel of claim 15, further
10 comprises a step of forming a color filter on the bottom surface of said transparent insulator
before forming said transparent electrode.

29. A method for manufacturing thin film transistor panel, at least, comprises following
step:

provide a silicon substrate;

bond a transparent substrate onto the back of said silicon substrate;

15 reduce the thickness of said silicon substrate to form a layer of crystal silicon thin film;

form a plurality of thin film transistor structures on said crystal silicon thin film;

etch said thin film transistor structure layer and said crystal silicon thin film to form
suitable pixel via;

form a planarization layer on said thin film transistor structure and said pixel via; and

20 form a plurality of transparent electrodes corresponding to the thin film transistor
structures on said planarization layer.

30. A method for manufacturing thin film transistor panel of claim 29, wherein the thickness of said transparent insulator is below one micrometer.

31. A method for manufacturing thin film transistor panel of claim 29, wherein the material of said transparent electrode is indium tin oxide.

5 32. A method for manufacturing thin film transistor panel of claim 29, wherein said transparent substrate is glass substrate.

33. A method for manufacturing thin film transistor panel of claim 29, wherein said transparent substrate is polymer substrate.

34. A method for manufacturing thin film transistor panel of claim 29, wherein the
10 method for removing said silicon substrate includes chemical mechanical polishing.

35. A method for manufacturing thin film transistor panel of claim 29, wherein said the method for removing said silicon substrate includes etching process.

36. A method for manufacturing thin film transistor panel of claim 29, wherein the method for forming thin film transistor structure comprise:

15 form a source region and a drain region on said crystal silicon thin film;

form a gate insulator covering said transistor thin film and said transparent electrode;

form a gate electrode on said gate insulator;

form a interlayer on said gate electrode and said gate insulator; and

form a metal contact layer on said gate insulator.

20 37. A method for manufacturing thin film transistor panel of claim 29, wherein the planarization layer is also color filter.